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Integrating context-awareness and UTAUT to explain Alipay user adoption

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ABSTRACT

Due to its advantages, Alipay has become one of the largest third-party payment platforms in China. However, Alipay is also confronted with dual challenges from inherent technology to external competition. In fact, Alipay user adoption is determined not only by perception of the technology but also by the context-awareness. In other words, even though a technology may be perceived as being advanced, if it cannot use the context to provide relevant information or services, they may not adopt it. By integrating the context-awareness and the unified theory of acceptance and usage of technology (UTAUT), this paper proposes a model of Alipay user adoption. We found that the relationship between the context and Alipay user adoption is mediated by performance expectancy and effort expectancy. While the relationship between the ubiquity and Alipay user adoption is only mediated by the performance expectancy.

1. Introduction

Alipay is one of the largest third-party payment platforms. The main services of Alipay are online shopping and offline physical store payment. Alipay makes the network payment more reliable and narrows the distance between consumers and merchants. Recently, Alipay has established strategic cooperative relations with more than 180 banks, VISA, MasterCard and other institutions. Despite the obvious advantages, Alipay is also confronted with dual challenges from inherent technology to external competition. For example, users' privacy is easy to leak which results in a lack of user trust. In addition, traditional banks and other third-party payment platforms (e.g., WeChat) make Alipay suffered with serious competition pressure. Therefore, by understanding the factors affecting Alipay user adoption, Alipay will be able to target bottlenecks that hinder user adoption and improve their services.

The extant research has tried to explain mobile payment user adoption from user perceptions of the technology such as perceived usefulness (Aldas-Manzano, Ruiz-Mafe, and Sanz-Blas, 2009), perceived ease of use (Kuo and Yen, 2009), relative advantage and compatibility (Chen et al., 2009) and task technology fit (Zhou et al., 2010). However, simply focusing on user perceptions of the technology may be not enough. The context-awareness model argues that individuals will adopt a technology based on whether it can use the context to provide relevant information or services (Schilit et al., 1994; Dey, 2001). It is possible that, although users perceive a technology as being advanced, they do not adopt it if they think this technology is unable to acquire and utilize information about the context of a device to provide services that are appropriate to the setting. In other words, these users may be utilitarian, and their adoption behavior is not only determined by their perception and attitudes toward the technology but also by a good context-awareness. In this paper, we integrate the context-awareness and unified theory of acceptance and usage of technology (UTAUT) model to explain Alipay user adoption from both perspectives including technology perception and context-awareness.

Our study makes two contributions. First, we apply context-awareness model to explain the mobile payment user adoption. The context-awareness model has been applied to mobile electronic patient records (Skov and Høegh, 2006), ubiquitous media (Zhang et al., 2013), web service systems (Truong and Dustdar, 2009) and mobile platforms (Yürür et al., 2016). We contribute to the literature by showing that context-awareness can influence Alipay user adoption. Second, the extant research on mobile payment user adoption primarily focuses on UTAUT (Venkatesh et al., 2003). We integrate both UTAUT and context-awareness to explain Alipay user adoption behavior and find that the relationship of the context and Alipay user adoption is mediated by the performance expectancy and effort expectancy.

2. Theory and hypotheses

2.1. Context awareness

In the work that first introduces the term “context-awareness”, Schilit et al. (1994) refer to context as location, identities of nearby

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people, hosts, and accessible devices, and changes to those things over time. The application software with these capabilities can examine the surrounding environment and react to the environment. Where you are, who you are with, and what resources are nearby are three important aspects of the context. Dey (2001) argues that this definition is too specific resulting that we cannot enumerate which aspects of all situations are important. Dey (2001) regards context as any information that can be used to characterize the situation of an entity. An entity is a person, place, or object that is considered relevant to the interaction between a user and an application, including the user and applications themselves. A software is context-aware if it uses context to provide relevant information or services to the user, where relevancy depends on the user's task. Thus, context refers to the physical and social situation in which computational devices are embedded. The goal of context-awareness computing is to acquire and utilize information about this context of a device to provide services that are appropriate to the setting (Thomas and Paul, 2001). For example, a cell phone will always vibrate and never beep in a concert, if the system can know the location of the cell phone and the concert schedule.

In this paper, we argue that context and ubiquity are two important aspects of context-awareness. Context refers to that the software provides service or information based on user's location, environment or state. Ubiquity refers to that user can select a mobile terminal at any time and any place to get the service or information. This idea highlights the important role of human–computer interaction. Lee (2005) explores the impact of perceptions of interactivity on customer transaction intentions in mobile commerce and finds that ubiquitous connectivity and contextual offer have a direct positive effect on transaction intentions. Li and Zhong (2016) point out that context-awareness has a positive influence on the mobile O2O user adoption. Chen (2008) further demonstrates that personalized, context, and ubiquity affect user attitude towards mobile O2O.

In the field of mobile payment, Alipay can choose appropriate service to users according to their location information, identity information, such as online payment, online shopping guarantee transactions, transfer accounts, credit card repayment, mobile phone recharge, personal finance and other financial services. Alipay can also establish a service bridge from retail stores, cinema, chain stores taxis and other entity industries to consumers anywhere. In addition, users can use Alipay through any mobile terminals at any time to trade so that this convenient and quick way to pay will greatly encourage consumers to use Alipay. Thus, we think that the ubiquity and context may influence Alipay user adoption.

H1. Context positively influence Alipay user adoption.

H2. Ubiquity positively influence Alipay user adoption.

2.2. UTAUT model

Researchers have examined mobile banking payment from the technology acceptance model (TAM). TAM theorizes that an individual's behavioral intention to use a technology is determined by two beliefs: perceived usefulness and perceived ease of use (Davis, 1989). The perceived usefulness is the extent to which a person believes that using the technology will enhance his or her job performance. The perceived ease of use is the extent to which a person believes that using the technology will be free of effort. According to TAM, perceived usefulness is influenced by perceived ease of use because, other things being equal, the easier the technology is to use the more useful it can be. Venkatesh and Davis (2000) extend the TAM by including subjective norm as an additional predictor of intention in the case of mandatory settings. TAM have been used to identify possible factors affecting mobile banking users' behavioral intention (Luarn and Lin, 2005). These factors include perceived usefulness, perceived ease of use, perceived credibility, self-efficacy, and perceived financial cost.

As an extension to TAM, UTAUT is used to measure the influence of an information technology on user adoption behavior (Venkatesh et al., 2003). In the UTAUT model, the user adoption is affected by social influence, performance expectancy, effort expectancy, and facilitating conditions. UTAUT model has been used to explore user adoption of mobile technologies (Park et al., 2007; Wu and Wang, 2005), mobile commerce acceptance (Min et al., 2008; Chen, 2008), course management software (Liu et al., 2007), and mobile banking user adoption (Zhou et al., 2010; Gu et al., 2009). A survey on potential adoption of mobile payments finds that perceived risk is a direct cause of their willingness to use mobile phones (Chen, 2008). Wu and Wang (2005) and Pavlou (2003) integrate perceived risk into the UTAUT to investigate what determines user mobile commerce acceptance. Perceived risk has a significant influence on behavioral intention to use mobile commerce (Wu and Wang, 2005; Pavlou, 2003). Thus, in our paper performance expectancy, effort expectancy, social influence and perceived risk were included in the UTAUT model.

Performance expectancy is the degree to which an individual believes that using the system will help him or her to attain gains in job performance (Venkatesh et al., 2003). Performance expectancy is the most powerful driving force of user adoption (Venkatesh et al., 2012). In this paper, performance expectancy means to use Alipay to complete the transaction expectancy more accurate and convenient. On the daily payment, people are often faced with waiting in line, thus the transaction site is difficult to reach. Using Alipay is an effective way to improve the payment. Alipay can provide users a precise solution according to their real-time position and identity status.

Context-awareness is a concept propagated in the domains of ambient intelligence and ubiquity computing. In the case of embedded services, the notion of context refers to process preferences of products and process skills of devices, physical capabilities of the equipment. Alipay can be both sensitive and reactive, based on user environment. Through improving accurate context service process and the degree of ubiquity, Alipay can improve user performance efficiency.

H3a. Performance expectancy plays a mediating role in the relationship between context and Alipay user adoption.

H3b. Performance expectancy plays a mediating role in the relationship between ubiquity and Alipay user adoption.

Effort expectancy is the degree of ease associated with the use of the system (Venkatesh et al., 2003). Alipay has a new e-commerce model as online payment platform, which combines mobile application client with intelligent hardware. Context and ubiquity of Alipay make users to spend little time and effort to consider time, location and other restrictions anytime, anywhere to use. Context and ubiquity provide simple operation, high degree of freedom of use experience, a greater extent to reduce users to pay for efforts to use Alipay.

H4a. Effort expectancy plays a mediating role in the relationship between context and Alipay user adoption.

H4b. Effort expectancy plays a mediating role in the relationship between ubiquity and Alipay user adoption.

Social influence is the degree to which an individual perceives that important others believe he or she should use the new system (Venkatesh et al., 2003). As a person in society, a user is very susceptible to the surrounding friends, colleagues, especially having an important influence on him. When friends, family or trading objects start to use Alipay, the context and ubiquity would be more intense.

At last, perceived risk refers to the degree of risk that consumers consider using Alipay (Pavlou, 2003). Pavlou (2003) confirmed that perceived risk negatively influenced acceptance of electronic commerce. Mallat (2007) indicated that adoption of mobile payments was affected by the perceived risk. Chen (2008) and Wu and wang (2005) also suggested that perceived risk was one of a decisive factor that affects the adoption of mobile payments. We proposed that perceived risk

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